SHREYAS KAMATH KALASA MOHANDAS

(210)-663-4766 | shreyaskamathkm@gmail.com | LinkedIn | Digital CV | Scholar

Artificial Intelligence (AI) | Computer Vision | Deep Learning (DL) | Machine Learning (ML) | Image Processing

- 8+ years of experience as a computer vision and machine learning specialist in academic and industry settings.
- Proficient in ML and DL practices, specializing in object detection, model compression, and image restoration and segmentation.
- 7+ years of coding experience with Python and deep learning frameworks, including Pytorch and TensorFlow.
- Committed collaborator with adept analytical, problem-solving, and communication abilities.

COMPUTER VISION, MACHINE LEARNING, AND DEEP LEARNING EXPERIENCE

SimpliSafe, Inc., Boston, MA (January 2022 – Present)

A home security and monitoring products -based company that specializes in security systems, cameras, video doorbells, and smart locks against intruders, fires, water damage, and medical emergencies.

Computer Vision Engineer – II (Computer Vision Analytics Team) (July 2023 – Present)

- Reduced False Positives attributed to rain, snow, and bugs by 90% by designing and developing novel motion detection algorithms to filter out fast-moving objects in edge systems.
- Implemented augmentation and Gen AI techniques that increased the dataset size by 3x to improve model training and performance.
- Developed tools for streamlining data collection and management pipelines for efficient deep learning model training.
- Explored methods for assessing image quality, devised setups to test various camera conditions, and evaluated object detection model performance to inform the selection of camera chips for next-generation devices.

Computer Vision Engineer – I (AI Research and Computer Vision Analytics Team) (January 2022 – July 2023)

- Achieved a 5% increase in mean average precision (mAP) by designing, developing, and training in-house YOLO object detection models, enhancing surveillance systems.
- Attained a remarkable 50% reduction in model compression and latency while maintaining a minimal 0.8% decrease in mAP through the development of advanced model compression tools.
- Elevated model performance by approximately 11% through data curation and novel augmentation techniques that emulate model inference behavior on edge devices.
- Partnered with senior specialists to deliver insightful analytical AI solutions; mentored an intern on AI best practices, coding standards, and successful project execution.

American Science and Engineering, Billerica, MA (May 2019 – August 2019)

A security-based company that specializes in detection technology to help secure borders, ports, and high-threat facilities from threats and contraband.

Computer Vision & Deep Learning Intern

- Developed DL models to detect contraband in backscatter X-ray images, contributing to improved security measures.
- Created intuitive visualization tools to facilitate the interpretation of CNN architectures, aiding in the analysis and optimization of model performance.
- Conducted extensive research on GAN-based approaches to synthesize contraband images to enhance model training.

Tufts University, Medford, MA (September 2016 – January 2022)

A 10,000-student private, nonsectarian R1 research university

Graduate Research Assistant, Vision, and Sensing System Laboratory

- Focused on conducting research in computer vision, image processing, and artificial intelligence for developing applications to solve complex problems faced in multimedia, healthcare, dental, and biometric industries.
- Worked closely with multiple departments and stakeholders to manage decisions and to select analytical methodologies, including data acquisition and curation, associated costs, and trade-offs, and developing prototypes.
- Designed and developed CNN models for object classification, detection, image restoration, and segmentation, including:
  - Achieved 96.2% accuracy on the Tufts Face database with a thermal facial emotion recognition model, enhancing emotion analysis in healthcare settings.

- Engineered a CNN model with a unique loss function for single-image exposure correction, restoring images captured on smartphones by synthesizing multiple exposures.
- Modeled a Quaternion CNN framework with Distributed Systems compatibility for super-resolution, achieving state-of-the-art performance metrics with 4x lower parameters and FLOPS.
- Implemented a novel CNN-based image segmentation system, surpassing state-of-the-art performance by 2% mIoU, enhancing image analysis in various industries.

EDUCATION

Doctor of Philosophy in Electrical and Computer Engineering (Ph.D.) Feb 2022

Tufts University, School of Engineering

- Dissertation: Bio-Inspired Visual Data Analytic with Applications in Nutrition and Biometrics; Advisor: *Dr. Karen Panetta*

Master of Science in Electrical and Computer (Engineering MS) May 2016

The University of Texas at San Antonio

- Thesis: Fingerprint Image Quality Assessment, Verification, And Detection; Advisor: *Dr. Sos S Agaian*

TECHNICAL SKILLS

- **Skills**: Object detection, localization, and tracking, image segmentation, image depth estimation, 3-D reconstruction, 3-D volume estimation, CNN, Transformers, and basic knowledge of Gen AI.
- **Programming Languages:** Experienced in Python, MATLAB, and basic knowledge of C/C++, Bash
- **Software/Libraries:** Experienced in Pytorch, TensorFlow, Keras, Numpy, Pandas, OpenCV, Scikit-Learn, Matplotlib, and basic knowledge in GitHub, Singularity, and Docker
- **Public Cloud Platform:** AWS EC2 instances, HPC
- **Operating Systems:** Experienced in Windows 10, Linux, and basic knowledge of macOS.

PUBLICATIONS & PATENT

A representative sample of the most relevant articles from a total of 22 papers

Journals

- Deep Perceptual Image Enhancement Network for Exposure Restoration - IEEE Transactions on Cybernetics, 2022.
- FTNet: Feature Transverse Network for Thermal Image Semantic Segmentation - in IEEE Access, 2021.
- A comprehensive database for benchmarking imaging systems - IEEE Transactions on Pattern Analysis and Machine Intelligence, 2018.

Conferences

- QSRNet: Towards quaternion-based single image super-resolution - Multimodal Image Exploitation and Learning, SPIE, 2022.
- DTTNet: Deep Transverse Network for monocular depth estimation - Multimodal Image Exploitation and Learning SPIE, 2022.
- TERNet: A deep learning approach for thermal face emotion recognition - Mobile Multimedia/Image Processing, Security, and Applications, SPIE, 2019

Patents

- System and Method for Multimedia Analytic Processing and Display. - U.S. Patent No. 11,450,087. 20 Sep. 2022.

AWARDS AND ACTIVITIES

- Awardee of Stern Endowed Graduate Research Fellowship for outstanding achievements and scholarly promise – 2020, 2021
- Reviewer- IEEE Open Access, IEEE Transactions on Systems, Man and Cybernetics: Systems, IEEE Symposium on Technologies for Homeland Security (HST '16), IEEE Open Access (2019, 2020), IEEE Transactions on Systems, Man, and Cybernetics: Systems (2018 - present), IEEE Transactions on Artificial Intelligence (2021 - present), MDPI (2022 - present)